R-Matrix Analysis of the ^{14}C System

T. N. Massey, J. F. Guillemette, S. M. Grimes, J. E. O'Donnell

Ohio University

Data for neutron scattering on ^{14}C and for the ^{10}Be$(\alpha, n)^{13}$C reaction have ben subjected to an R-Matrix analysis. A number if deficiencies in the fit were noted when the conventual approach to fitting was used. Two additional techniques have been introduced to improve the fits. Level spins, parities and spectroscopic factors were obtained from a shell-model calculation. These were then used to determine starting R-matrix parameter values. A better R-matrix fit was obtained by this method. In addition, a random walk search procedure was introduced. Though not highly efficient, use of this procedure over forty eight hour periods greatly improved the results.

Email: massey@ohiou.edu